	Application No.	Applicant(s)
Notice of Allowability	09/754,570	YAKHNICH ET AL.
	Examiner	**Art Unit**	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amdt filed on 4/2/2005*.

2. ☒ The allowed claim(s) is/are *1-24 and 26-74, which have been renumbered claims 1-73*.

3. ☒ The drawings filed on *02 April 2005* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

        Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes and/or

additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the

payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with

Howard Zaretsky on 4/21/2005.

The application has been amended as follows:

Claim 26 (currently amended). The method according to claim 18, wherein said soft

symbol values are generated by a maximum likelihood sequence estimation (MLSE) equalizer

based on the Soft Output Viterbi Algorithm (SOVA).

Claim 27 (currently amended). The method according to claim 18, wherein said soft

symbol values are generated by a maximum a posterior (MAP) algorithm based equalizer.

Claim 54 (currently amended). A communications receiver for receiving and decoding

an M-ary transmitted signal, comprising:

a radio frequency (RF) front end circuit for receiving and converting said M-ary

transmitted signal to a baseband signal;

a demodulator adapted to receive said baseband signal and to generate a received signal

therefrom in accordance with the *M*-ary modulation scheme used to generate said transmitted

signal;

a first decoder operative to receive said received signal and to generate a sequence of soft

symbol decisions therefrom;

a soft symbol to soft bit output converter comprising processing means programmed to:

receive a plurality of soft symbol values for each symbol;

determine, for each bit position of interest, a first symbol value corresponding to a

maximum soft symbol value wherein the bit of interest is a zero and a second soft symbol

value corresponding to a maximum soft symbol value wherein a bit of interest is a one;

utilize an overall maximum soft symbol value for either said zero bit or said one

bit in accordance with the value of the bit in the bit position of interest of said overall

maximum soft symbol;

utilize for the other bit, the value of a soft symbol closest in Euclidean distance to

said overall maximum soft symbol whose bit in the position of interest is opposite that of

the analogous bit in said overall maximum soft symbol;

approximate a log likelihood ratio for a particular bit of interest as the difference

between said second soft symbol value and said first soft symbol value; and

a second decoder adapted to receive soft bit values and to generate binary received data

therefrom.

Claim 61 (currently amended). The receiver according to claim 54, wherein said *M*-ary
signal comprises an 8-PSK signal.

Claim 62 (currently amended). The receiver according to claim 54, further comprising
the step of generating said soft symbol values represented as log likelihood ratios (LLR).

Claim 73 (currently amended). The computer readable medium to claim 69, wherein said
computer program is suitably programmed to output soft bit information to a soft decoder for
decoding into binary data therefrom.

EXAMINER'S STATEMENTS OF REASONS FOR ALLOWANCE

2.   The following is an examiner's statement of reasons for allowance: Claims 1-17 and 32-
48, which have been renumbered claims 31-47, respectively, are allowable over prior art
references because related references do not disclose partitioning soft symbol decisions into bit
groups, each group comprising a zero bit portion and a one-bit portion and determining soft bit
values from those groups. Claims 18-24, 26-31,and 49-74 which have been renumbered claims
25-30 and 48-73 respectively, are allowable over prior art because related references do not
disclose receiving soft symbol values represented as symbol log likelihood ratios wherein the
soft symbol values comprise a first soft symbol value corresponding to a most likely (maximum
soft) symbol and second soft symbol values wherein each second soft symbol value corresponds
to a symbol closest in Euclidean distance to said most likely symbol whose bit in the position is

opposite that of the analogous bit in said most likely symbol; and calculating a soft bit value

based of the first and second soft symbol values.

Any comments considered necessary by applicant must be submitted no later than the

payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for
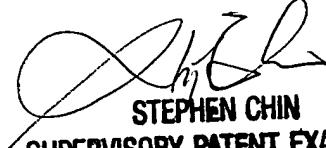
Allowance."

Conclusion

3.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The

examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
April 22, 2005

STEPHEN CHIN
SUPERVISORY PATENT EXAMINE
TECHNOLOGY CENTER 2800